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MCRD PARRIS ISLAND
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U S NAVY RESPONSES TO U S EPA REGION IV COMMENTS ON DRAFT REMEDIAL
INVESTIGATION/RESOURCE CONSERVATION AND RECOVERY ACT FACILITY
INVESTIGATION WORK PLAN FOR SITE 45 MCRD PARRIS ISLAND SC
2/1/2001
NAVAL FACILITIES ENGINEERING COMMAND SOUTHERN DIVISION

**U.S. EPA COMMENTS ON
DRAFT REMEDIAL INVESTIGATION/RCRA FACILITY INVESTIGATION WORK PLAN
SITE/SWMU 45
U.S. MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA
EPA ID# SC6170022762**

General Comments:

1. **Comment:** The general technical approach presented in the Work Plan is technically adequate, but there are concerns regarding the necessity of additional testing of air sparging, the contingencies for defining the nature and extent of contamination in surface soil and the Floridian aquifer, and the type(s) of groundwater model(s) to be used and the expected model inputs and outputs.

Response: Specific responses regarding the air sparge testing, and defining nature and extent issues, and ground water modeling are presented below.

2. **Comment:** The development and presentation of Data Quality Objectives (DQOs) and the project Quality Assurance Plan (QAP) is inadequate to meet EPA requirements. While the planned data acquisition would seem to correspond to the more evident data needs, the lack of specific DQO problem statements makes this difficult to evaluate. Moreover, the quantity and quality of data proposed has not been substantiated (see specific comments), for example why is slug testing data being collected and how will it be used. The specific QAP requirements should reflect the established DQOs.

Response: The intent of the Navy's Work Plan, as presented, is to efficiently comply with Navy and EPA DQO and QAP requirements. To accomplish this task, a Master Work Plan was prepared and approved by the U.S. EPA and SCDHEC in 1998 and includes the common information for the MCRD Parris Island installation, project decision making processes, and data quality requirements. The Site 45 Work Plan presents only the new and most relevant information needed for review and concurrence of the field program by the partnering team. The EPA QAP checklist (Table RTC) is attached to serve as a cross walk table to aid in your review.

The Navy considers the DQO process to be an excellent approach for developing and documenting the elements of a field program. However, there is project specific flexibility in the level of detail needed to complete the DQO process. Since, the number and type of samples to be collected were discussed and agreed to by a diverse group of experienced personnel, (the

partnering team), the need to document each proposed test through the DQO process is not as rigid in this case. Specific issues mentioned in the comment are discussed below in response to specific comments.

Specific Comments:

1. **Comment:** Page 1-5, Figure 1-2. The decision rules and limits on decision error are project specific, and should be included in the Work Plan. Reference to the Master Work Plan is not sufficient.

Response: Figure 1-2 will be changed to reference Section 4.2 of the Work Plan and the Master Work Plan. Because of the type of project at Site 45, limits on the decision error are not applicable in this case. For groundwater, the only significant criteria are MCLs. As discussed during the last few partnering team meetings, additional monitoring wells will be installed to define the extent of groundwater contamination. Because of the mobile type of contamination, and previous soil removal, site related contamination is not expected to be found in the site soils.

2. **Comment:** Page 2-1, section 2.2.1, 1st paragraph, 3rd sentence. Please include the depth below ground surface, as well as the elevation relative to mean sea level, for subsurface data.

Response: The referenced discussion addresses general site information based on limited subsurface data. To add the requested data would imply a level of accuracy greater than that available. As a result, for consistency, the reference to the Hawthorne being approximately 30 feet below mean sea level will be deleted. Please note that this information will be specifically addressed in the Remedial Investigation Report for the site.

3. **Comment:** Page 2-6, section 2.4. This problem statement is too general to support development of DQOs for this project. Multiple problems exist at this site that may require additional data to support decision making, such as: the nature and extent of surface soil contamination exceeding risk-based concentrations has not been defined, it has not been determined whether contaminant concentrations in subsurface soil are contributing to groundwater contamination, the extent of shallow groundwater contamination has not been defined, the presence or absence of DNAPL has not been determined, potential impacts to the Floridian aquifer have not been addressed, design data for optimizing the existing treatment system and/or assessing the potential for MNA have not been collected, and data of sufficient quality and quantity to assess human health and ecological risks from exposure to soil, groundwater or surface water have not been collected.

Response: The following clarification will be added to the Statement of Problem Section.

"Specific potential concerns at the site are as follows.

1. The soils associated with the reported solvent spill were remediated at the time of the spill. However, based on the current distribution of groundwater contamination, groundwater may have been impacted from more than just the reported spill area and therefore additional contaminated soils may be present at the site. Potentially impacted soils may consist of both surface and subsurface soils. The potential concerns with impacted soils are direct exposure to human health and contaminant migration to groundwater. Potential source areas at the site would consist of unlined waste accumulation areas, dry cleaning units, and cracks in the building floors.
 2. The extent of the groundwater contamination was previously delineated in the horizontal direction and was also likely delineated in the vertical direction. Since that time, a groundwater extraction and treatment system was installed to contain or reduce the migration of contaminated groundwater. The effectiveness of this system in containing groundwater contamination is uncertain. As a result, the current vertical and horizontal extent of groundwater is undefined.
 3. There are no nearby receptors of groundwater. However, contaminated groundwater may be migrating toward a tidal stream of the Beaufort River, approximately 2000 feet south-southeast of the site.
 4. Contamination may also be migrating downward, either with groundwater or as a DNAPL. A clay unit at the site likely restricts vertical migration downward into the underlying groundwater aquifer (Floridan). In addition, the water head gradient from the Floridan aquifer at this site is expected to be upward and therefore limit potential contamination of the underlying aquifer. The rate of migration, contaminant attenuation (monitored natural attenuation), and potential impacts of the contaminated groundwater on ecological receptors is uncertain.
4. **Comment:** Page 4-1, section 4.0, 1st paragraph, 1st sentence. The word "No" appears to be incorrect, please clarify.

Response: Agreed, no will be deleted from this sentence.

5. **Comment:** Section 4.0. The content of this section does not fully meet the requirements for DQOs. Planned data collection should correspond to specific data needs that support the decision making process. The Investigation Rationale should tie the identified data need together with the data type, quantity and quality proposed.

Response: Most of the information requested is presented in this section, however it is presented in a different format than that requested. Table 4-1 presents the specific data needs to resolve data gaps. Table 4-2 presents the data type and quantity. Additional detail will be added to the report as indicated in the responses below.

6. **Comment:** Page 4-1, section 4.1, 2nd bullet. Defining the horizontal and vertical extent of groundwater contamination must be an explicit objective of the RI.

Response: Agreed, the second sentence will be modified as follows. Therefore, sampling of the surficial aquifer is proposed to determine“ the horizontal and vertical extent of groundwater contamination and “ whether site-related ...

7. **Comment:** Page 4-2, section 4.2.1.1. Clarify what contingency approach will be used if the eight sample locations chosen do not adequately bound the area(s) of soil contamination.

Response: Site related soil contamination is not expected to be found at the sample locations. But if found, the extent should be limited to the immediate area, and at worst, contained within the area of groundwater contamination. This delineation should be adequate for a feasibility study.

In accordance with the practice performed at other MCRD Parris Island sites, soils results will be presented to the partnering team, and if a significant data gap is identified, additional soil testing may be considered at that time. However, if needed, final delineation of soil contamination will not likely occur until PRGs are developed and a remedy has been selected.

8. **Comment:** Page 4-3, section 4.2.1.2, 4th paragraph. Further develop the proposed rationale (i.e., develop decision rules) for siting the three permanent monitoring well clusters with regard to the following concerns: will the wells be sited and constructed to support dual use (monitoring and remediation), how will the locations be "based" on the initial sampling (i.e., co-located to provide more definitive data or located to fill remaining data gaps), and how will the monitoring interval(s) be selected. Finally, clarify what contingency there is for monitoring the upper Floridian aquifer if contamination is present in the Hawthorn formation below the source area(s).

Response: The available rationale for placing these wells is already presented in this section. However, the need for and potential locations of these extra wells is uncertain at this time and therefore developing a decision tree would not be efficient. During the investigation, we expect to present the results and recommendations for additional wells to the partnering team for a decision. To clarify this approach, the text in the last paragraph of this section will be modified as follows.

The locations of the permanent wells will be proposed to “the partnering team for a decision and then be presented” in a work plan addendum...

Regarding well placement into the Floridan Aquifer, the Navy does not plan to install any wells into this confined drinking water aquifer unless absolutely necessary. The primary concern with installing deep wells is that a monitoring well in this area could create a conduit from an area of known contaminated groundwater into a high quality drinking water aquifer. Also, based on current information, there is a confining unit present at the site (Hawthorne) and there should be an upward gradient from the Floridan Aquifer into the surficial aquifer. The initial phase of the temporary monitoring well program will confirm the presence of the confining unit.

9. **Comment:** Page 4-3, section 4.2.1.3. Please include discussion of whether or not the previously observed contaminant concentrations are indicative of the presence of DNAPL, and what data (which borings at what depths) is expected to substantiate the presence or absence of DNAPL.

Response: The following statement will be modified as indicated.

Given the historical concentrations of chlorinated solvents in Site 45 soil and groundwater, “isolated pockets of DNAPL may be at the site, and therefore” the presence of DNAPLs will be investigated.

Also, the last sentence will be modified as follows. A minimum of one sample per boring in the source area “(area bounded by Panama, Samoa, and Kyushu Streets)” will be checked. Also, Tables 4-2, 7-1, and 7-2 will be revised to reflect 8 soil borings and 9 temporary monitoring wells for DNAPL evaluations.

10. **Comment:** Page 4-3, section 4.2.1.3, 6th sentence. Please clarify what fluorescent techniques will be used, how they will be applied, and what their limitations are (i.e., effective detection limits).

Response: A reference to the evaluation technique will be added to the report. But in general, many organics will glow when light of a certain wavelength is applied (e.g. ultraviolet light). Detection limits don't apply, but even small (spec size) globules of organics can be observed.

11. **Comment:** Page 4-3, section 4.2.2. Specify which model(s) are planned for use, and how the modeling will be used to support the development and selection of remedial alternatives.

Response: The following will be added to Section 4.2.2.

"BIOCHLOR and/or modflow/RT3D will be used for the modeling."

12. **Comment:** Section 4.2. Please add references to section 6.0 or to the relevant standard operating procedures in the descriptions of the various data collection activities, as applicable.

Response: References will be added as requested.

13. **Comment:** Page 4-3, section 4.2.1.2, 3rd and 4th paragraphs. Clarify whether the data quality of the samples from the temporary wells will be sufficient to support risk assessment and whether it will be compared to the data from the permanent wells (i.e., a data quality comparison). If only the data from the permanent wells will be used for assessing risk from groundwater, please clarify how this limited sample population will be sufficient to for risk assessment.

Response: The following will be added to the referenced text.

"Because of the absence of laboratory documentation and data validation, the temporary monitoring well data will not be used in the human health or ecological risks assessments. Rather, data from the existing permanent monitoring wells coupled with data from potential future permanent monitoring wells will be used for the risk assessments."

There are currently 16 monitoring wells present at the site. This number of wells is adequate for risk assessment.

14. **Comment:** Page 4-4, section 4.2.2.2. Additional description of the method(s) planned for performance and analysis of slug testing should be provided. Additionally, the rationale and use of the slug test data should be presented. Since a pump and treat system is in place, pump

testing of the new and existing wells could easily be performed and would provide much higher quality aquifer characterization data.

Response: The SOP for conducting slug tests will be added to the Appendix and referenced in the text.

“The slug tests are to be conducted in the new monitoring wells. Since these wells are likely to be relatively remote from the existing groundwater extraction system, these tests will provide additional characterization of the aquifer down gradient of the source area.”

Slug tests are normally conducted in all permanent monitoring wells because they provide reasonable quality data very efficiently. While we concur that pump tests provide a much higher quality of data, they are very expensive to conduct and the need for such a high quality of data at all well locations is not anticipated at this time. In the event that significant data gaps are found, then additional pump tests can be considered.

15. **Comment:** Page 4-6, section 4.2.5. Include an analysis of the deficiencies with the previous air sparging pilot test that necessitates further testing of this alternative.

Response: Deficiencies were not noted with the previous air sparging test. However, the following statement will be added to Section 4.2.5.

“If the existing lithology is such that an air sparge/soil vapor extraction system is potentially viable (relatively free of clay units as determined during the temporary monitoring well program), then an air sparge/soil vapor extraction system will be evaluated in the source area of contamination. Since the source area was an occupied building in the past, the test was conducted in an adjacent clean area that may or may not be representative of site conditions. “

16. **Comment:** Page 4-8, Table 4-2. The text supporting the investigative summary does not clearly explain/reference all of the activities presented in this table (e.g., collection of shelly tube samples for testing of vertical hydraulic conductivity from the Hawthorn formation). The use/purpose of the data collected should be clearly explained, and the quantity and quality requirements for the data should be justified in the text. In general, RI data should be sufficient to use for definition of the nature and extent of contamination, support risk assessment, and allow for development of remedial alternatives.

Response: The proposed data collection is sufficient to define the nature and extent of contamination, support risk assessment, and allow for the development of remedial alternatives. Justification for the quantity and quality of samples and data collected consists of submitting the approach to a group of experts (i.e. partnering team) for review, comment, and concurrence. In many cases, the number of samples and analyte list is based on previous experience of the authors and reviewers.

17. **Comment:** Page 5-1, section 5.1, 1st paragraph, 2nd sentence. Please clarify what current and historical data will be used to support the risk assessment (e.g., validated results from approved fixed-base laboratories that is less than three years old). Provide a summary table by media and analyte group of the population of data anticipated to comprise the BRA.

Response: The following statements will be modified as indicated below.

Analytical data generated under this work plan “for soils and groundwater from newly installed permanent monitoring wells”, as well as “the most recent” historic data “consisting of groundwater data from permanent monitoring wells”, will be used...

“Soils will be evaluated for site related contaminants of VOCs, as well as potential non site related SVOCs and metal chemicals.” Groundwater will be evaluated for VOCs contaminants.”

18. **Comment:** Page 5-1, section 5.1, 2nd and 3rd paragraph. A technical memorandum should be considered as an appendix to this plan describing and justifying the risk assessment approach (i.e., COC selection, pathways of concern, and receptors) following evaluation of the initial RI data.

Response: A human health risk assessment will be conducted in accordance with EPA guidance. Because of the EPA guidance available, the team does not have much flexibility in deciding how the risk assessment will be conducted. As in the past, prior to issuing the RI report, the risk assessment will be presented to the partnering team for review and comment.

19. **Comment:** Page 5-2, section 5.2, 1st paragraph. The project risk assessment approach should be agreed prior to completing the BRA (see specific comment 18). The technical approach to performing ecological risk assessment should reflect the results of the Partnering Team ecological risk subcommittee.

Response: The site specific ecological risk assessment approach is presented in Section 5.2 of the Work Plan for review and concurrence of the partnering team. Approval of the Work Plan by the EPA and SCDHEC establishes the approach. Note that we plan to submit the results of the investigation to the partnering team and barring the finding of unanticipated results, this approach is the only planned ecological evaluation for this site. As discussed below, we do not anticipate the findings of the ecological risk subcommittee to effect the Site 45 work.

The purpose of the ecological group is to help establish sediment PRGs at landfills encroaching on wetlands. The ecogroup was formed because these sites are complex with multiple types of contaminants (PCBs, pesticides, PAHs, SVOCs, and metals) that are present in sediments at ecologically unacceptable concentrations. These contaminants are relatively toxic at low concentrations to the benthic community and are persistent in the environment. Additionally, most of these contaminants biomagnify through the food chain. Because of these complexities, the ecological subgroup was established to focus specifically on resolving those issues so that consensus could be reached

Site 45 is different, because Site 45 is primarily a human health/regulation driven site and ecological concerns are not expected to be significant. The most recent estimate of the extent of contamination indicates that the contaminated groundwater is relatively distant from the nearest potential ecological receptors and contaminants are not migrating very fast. Also, the site contaminants are VOCs which do not biomagnify and are not persistent in the environment.

20. **Comment:** Page 6-2, section 6.3.2, 2nd paragraph, 2nd sentence. Please further describe the "stainless steel drive rods" to be used for groundwater sampling. Is this a well point assembly or just an open ended drive rod?

Response: The sentence will be modified as follows.

Next, stainless steel drive rods, "with slots on the side of the tube" will be driven to sample depth.

21. **Comment:** Page 6-4, section 6.4.1, 1st paragraph, 1st sentence. Clarify how stability of the groundwater field parameters will be established.

Response: Since the temporary monitoring wells are for VOCs and the wells are being driven into undisturbed media, the statement "and these readings have become stabilized." will be deleted.

22. **Comment:** Page 6-4 through 6-5, section 6.4.2. Provision for the development of the permanent monitoring wells should be included. The well development criteria should meet or exceed EPA standards as specified in Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EPA, 1996).

Response: Well development is stated in the last paragraph of this section, which references the Master Work Plan.

23. **Comment:** Page 7-2, section 7.3.1, 2nd sentence. The site-specific Quality Assurance Plan (section 8.0) does not contain the referenced information, but does further cross-reference to section 10.0 where the container requirements are specified. Please reference the appropriate section, and see specific comment 27 regarding the required content for a project QAP.

Response: The referenced sentence will be modified as follows. "Sample handling requirements for this investigation are presented in Section 10.0. "

24. **Comment:** Page 7-3, section 7.3.4, 3rd sentence. The referenced standard operating procedure may need to be changed to SA-6.3 for sample custody. It should be noted that the definition of custody and specific requirements for the maintenance of custody are not specified in either SOP.

Response: The sentence will be modified to reference both SA-6.1 and SA-6.3.

25. **Comment:** Page 7-5, Table 7-1. This presentation of planned soil data collection is helpful in discriminating the locations and data types for the "nature and extent" and the "groundwater modeling" borings. The text in sections 4.0 and 7.0 should more closely/clearly correspond with this table. The quantity, type, locations and sample identifiers should be presented in the text, and these should correspond to the DQOs.

Response: The presentation in the text is adequate for our needs. We normally use the tables as a check list for collecting samples.

26. **Comment:** Page 7-6 and 7-7, Table 7-2. Please include TCL VOAs for the permanent monitoring wells on this table.

Response: At this time, it is uncertain as to whether additional permanent monitoring wells will be installed. If the wells are to be installed, then a separate analytical table will be submitted with the monitoring well installation addendum.

27. **Comment:** Page 8-1, section 8.0. This section, including the referenced information, does not meet EPA Quality Assurance Plan (QAP) requirements. A review of the Master QAP indicates that appropriate generic/sitewide content (e.g., audit and corrective action processes) is included, however there remains significant project-specific content that is not presented in the project Work Plan. An EPA QAP checklist is attached to assist the Navy in meeting the relevant requirements. If the project QAP content will be presented across various portions of the project Work Plan and Master Work Plan, it is recommended that a crosswalk table be prepared to facilitate evaluation.

Response: The EPA QAP checklist as a cross walk table is attached.

28. **Comment:** Page 9-1, section 9.1. Figure 9-1 was missing from the review copy of the Work Plan provided.

Response: Figure 9-1 will be included in the revised report.

29. **Comment:** Page 10-1, section 10.0, 1st sentence. Clarify what "DQO statements" are being referred to. It is agreed that the project QC requirements should be the result of data needs identified during the DQO process. That this is the case is not clear.

Response: Figure 1-2 will be referenced in this sentence.

30. **Comment:** Page 10-1, Table 10-1. Clarify whether these QC requirements are intended to be applied to geotechnical samples as well. Also, clarify what site conditions might require the use of field blanks.

Response: The first sentence in Section 10.2.1 will be revised as follows. Table 10-1 summarizes the frequency and type of QA/QC samples to be collected "for data to be validated and includes analytical testing of soils (all) and groundwater from permanent monitoring wells. Soil testing for geotechnical parameters and groundwater testing for quick turn around VOCs will not be subjected to these field QC samples. However, groundwater testing for quick turnaround testing will include trip blanks for each cooler plus 10 percent of the samples as duplicates being submitted for confirmation testing. "

Frequency for Field Blanks and Equipment Rinsate Blanks will be changed to "1 every 2 days¹." Where, "1 - Blanks are to be collected and analyzed to document the effectiveness of the

decontamination procedure when reusable sample equipment comes in direct contact with samples to be analyzed.”

Note that field blanks and equipment blanks are not expected to be used in during this program.

31. **Comment:** Page 10-3, section 10.7. The extent of data validation should also be a result of the DQO process.

Response: Full data validation will be conducted on all samples submitted to the laboratory for TCL/TAL analysis.